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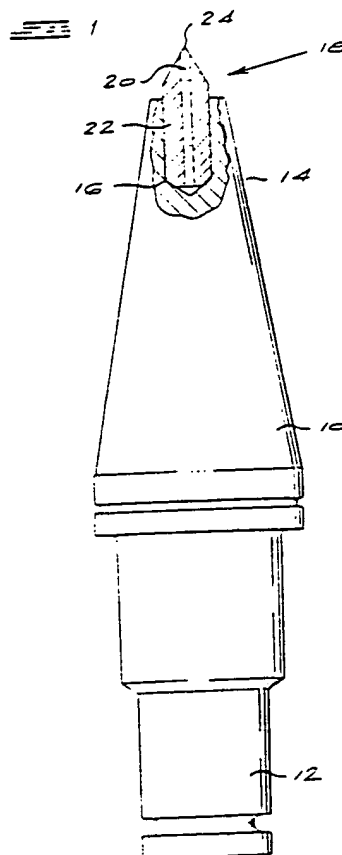
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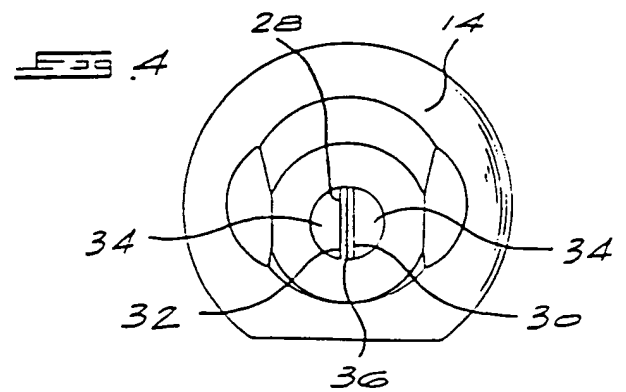
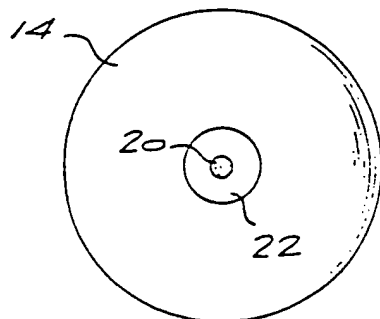
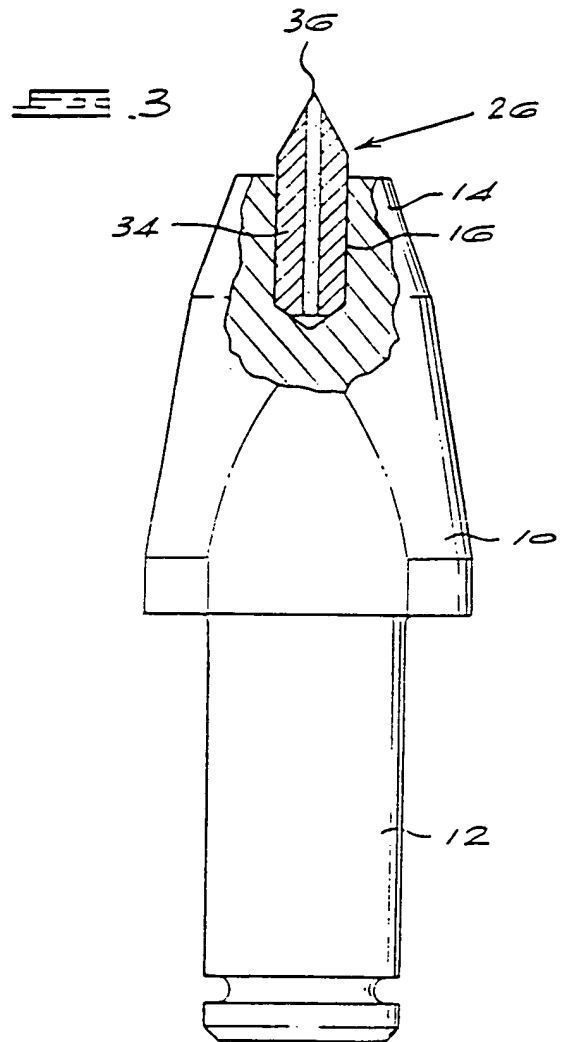
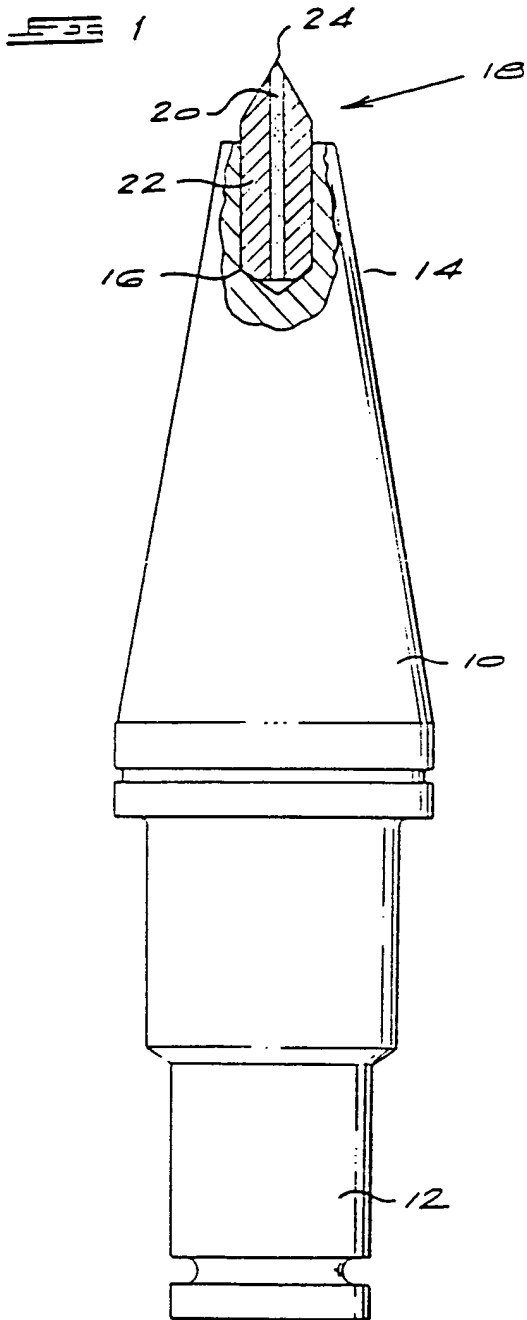
(54) Cutting tool for a mining machine

(57) A cutting tool for a mining machine of the type used to cut soft materials such as coal is provided. The cutting tool comprises a holding lug (10), one end (12) of which is adapted to be mounted in or on a working surface of the machine and the other end (14) of which has a socket (16) in which is located a cutting element (18). The cutting element (18) comprises an elongate abrasive compact core (20) surrounded by a cemented carbide sleeve (22) which is bonded to it. The abrasive compact core (20) presents a cutting point (24) or a cutting edge (see Figs 4 and 6 not shown).



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FIG 5

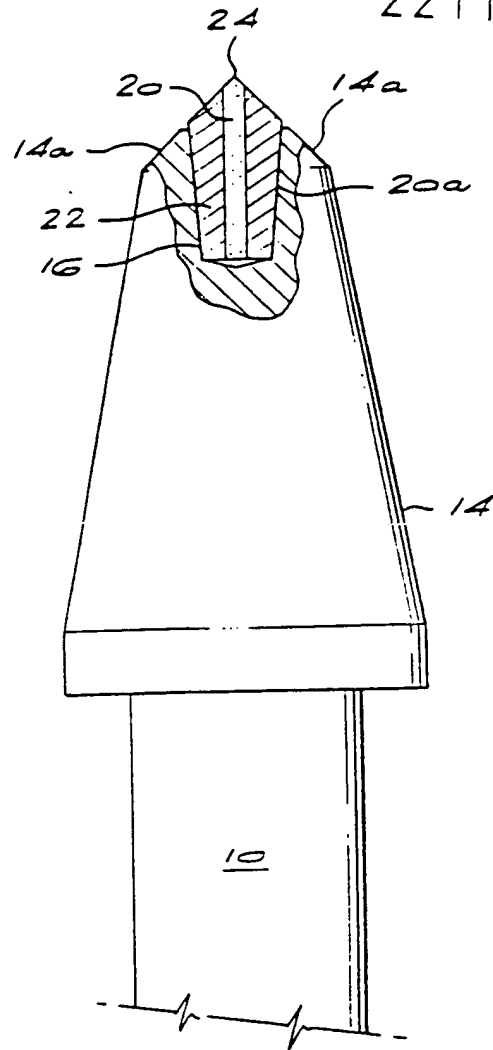
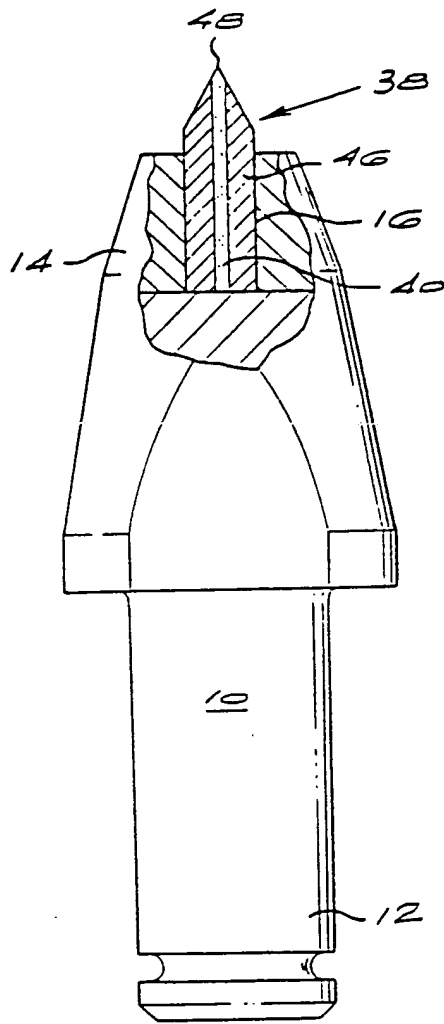
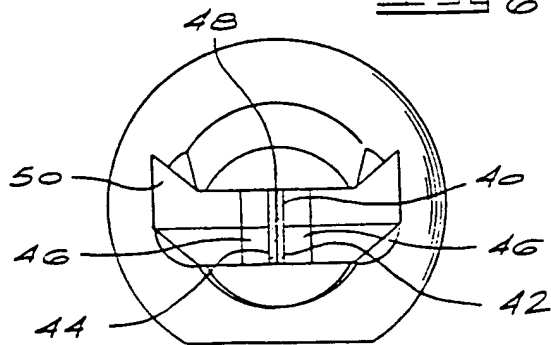


FIG 6

FIG 7



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CUTTING TOOL FOR A MINING MACHINE

BACKGROUND OF THE INVENTION

This invention relates to a cutting tool for a mining machine of the type which is used to cut a variety of soft materials such as coal.

In mining machines of this type, a plurality of cutting tools (also known as picks) are positioned on a working surface, for example, the surface of a drum, and moved in a cutting direction against the face of the material to be cut. Each tool comprises a holding lug and a cutting element secured in a bore or socket in the lug. The cutting element may be made of a wear-resistant material such as cemented carbide. Alternatively, the cutting element may comprise an elongate pin, one end of which has secured to it an abrasive compact which provides a cutting edge for the element.

SUMMARY OF THE INVENTION

According to the present invention, there is provided a cutting tool for a mining machine of the type described above comprising a holding lug, one end of which is adapted to be mounted in or on a working surface of the machine, and the other end of which has a socket and a cutting element located in the socket, the cutting element comprising an elongate abrasive compact presenting major surfaces on each of opposite sides thereof, a cutting point or edge at one end of the compact, and a relatively large mass of cemented carbide bonded to each of the major surfaces.

The cutting element may take a variety of forms. For example, it may take the form of a pencil having a centre core of abrasive compact surrounded completely by a cemented carbide sleeve which is bonded to it. In another example, the compact has a rectangular section and presents elongate rectangular major surfaces on each of opposite sides thereof to which are bonded cemented carbide masses.

DESCRIPTION OF THE DRAWING

Figure 1 illustrates a partially sectional side view of an embodiment of the invention;

Figure 2 is a plan view of Figure 1;

Figure 3 illustrates a partially sectional side view of a second embodiment of the invention;

Figure 4 is a plan view of Figure 3;

Figure 5 illustrates a partially sectional side view of a third embodiment of the invention;

Figure 6 illustrates a plan view of Figure 5; and

Figure 7 is a partially sectional side view of a fourth embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

The abrasive compact may be any known in the art. Abrasive compacts consist essentially of a mass of abrasive particles present in an amount of at least 70 percent, preferably 80 to 90 percent, by volume of the compact bonded into a hard conglomerate. Compacts are polycrystalline masses containing a substantial amount of direct particle-to-particle bonding. The abrasive particles of the compacts are invariably ultra-hard abrasives such as diamond and cubic boron nitride. Diamond and cubic boron nitride compacts are manufactured under conditions of temperature and pressure at which the abrasive particle is crystallographically stable.

The cutting elements which are used in the invention may be made by a method described in British Patent Specification No. 1,579,204.

The total cemented carbide mass will typically be at least 60 percent by mass of the cutting element. The cemented carbide may be any known in the art, preferably cemented tungsten carbide.

Three embodiments of the invention will now be described with reference to the accompanying drawings. Referring first to Figures 1 and 2, a cutting tool for a mining machine comprises a holding lug 10 having one end 12 adapted to be mounted in or on the working surface of a rotatable drum and a cutting end 14. The cutting end 14 has a socket 16 in which is mounted a cutting element 18. The cutting element 18 comprises a cylindrical core 20 of abrasive compact surrounded by a sleeve of cemented carbide 22 which is bonded to it. The core 20 presents a cutting point 24. The cutting element is, in effect, of pencil-shape. The

cutting element may be brazed into the lug which itself can rotate in the drum surface.

The embodiment of Figures 3 and 4 are similar to that of Figures 1 and 2 and like numerals are used to describe like parts. The cutting element 26 in this embodiment is of sandwich-shape having an elongate core 28 of rectangular section which presents major surfaces 30, 32 on each of opposite sides and to which are bonded cemented carbide supports 34. The abrasive compact 28 is shaped to present a cutting edge 36. The cutting edge 36 may also be a point, as in Figure 1. The cutting element is brazed to the lug. The cutting tool of this embodiment will be non-rotating in use.

The embodiment of Figures 5 and 6 is again similar to that of the previous embodiments. Like numerals are used to designate like parts. In this embodiment, the cutting element 38 comprises an elongate abrasive compact 40 of rectangular section presenting major surfaces 42, 44 to which are bonded cemented carbide supports 46. The abrasive compact presents a cutting edge 48. The cutting element is located in and bonded to a supporting body 50 which itself is fixed to the cutting end 14 of the holding lug. The cutting tool of this embodiment will be non-rotating in use.

The embodiment of Figure 7 is similar to that of Figures 1 and 2 and like numerals represent like parts. It will be noted that the side surface 20a of the cylindrical core 20 of the cutting element 18 tapers inwardly from the cutting end 24 of the other end. Further, the sides 14a of the cutting end 14 of the holding lug are cut-away minimising erosion and abrasion of this end during use.

CLAIMS

1.

A cutting tool for a mining machine of the type used to cut soft materials such as coal comprising a holding lug, one end of which is adapted to be mounted in or on a working surface of the machine and the other end of which has a socket and a cutting element located in the socket. the cutting element comprising an elongate abrasive compact presenting major surfaces on each of opposite sides thereof, a cutting point or edge at one end of the compact and a relatively large mass of cemented carbide bonded to each of the major surfaces.

2.

A cutting tool according to claim 1 wherein the cutting element has the form of a pencil having a centre core of abrasive compact completely surrounded by a cemented carbide sleeve which is bonded to the compact.

3.

A cutting tool according to claim 1 wherein the abrasive compact of the cutting element has a rectangular section and presents elongate rectangular major surfaces on each of opposite sides thereof, to each of which is bonded a cemented carbide mass.

4.

A cutting tool according to any one of the preceding claims wherein the total cemented carbide mass is at least 60 percent by mass of the cutting element.

5.

A cutting tool according to claim 1 and substantially as herein described with reference to any one of Figures 1 to 7 of the accompanying drawings.